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Combat Crew

strategic air command

NOVEMBER 1987

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PERSPECTIVE

Major General Randall D. Peat
Chief of Staff
Strategic Air Command

As I return to SAC and complete my first four months as your Chief of Staff, I want to share some thoughts with you. Although my travels have been limited since assuming my current duties I have been "watching" the Command in action for many years from assignments in the Air Staff, Joint Staff and NATO. It is a great pleasure for me to be able to meet on their home ground the impressive people that make up this Command.

SAC is an exciting command and going through a very dynamic period in its forty-year history. As we have transitioned from a concentration on our nuclear mission to a better balanced nuclear and conventional force, we have experienced some growing pains. All of us must lean forward as we continue to modernize and evolve. Strong conventional forces are essential to deterrence and defense—and we have made great strides in rebuilding our conventional capabilities. As a result we can be much more confident today of our ability to counter, and therefore deter, threats to our country's interests around the world. Our objective is to improve the combat capability of our forces through a steady and balanced program. Those of us who were in Washington during the early 1980s and were part of the defense planning apparatus are extremely proud that SAC has sustained the momentum of the Strategic Modernization Program through 1987. We can't stop now—we must continue to do so in the future. Specific emphasis must continue to be placed on deployment of Peacekeeper, the further development of the Peacekeeper Rail Garrison concept, Small ICBMs, B-2s, and Command, Control and Communication Programs to name a few.

I would like to focus on our professional people for a moment. You have heard it many times—because it's true—people are our most important resource. You make everything we do possible. You are the heart of our organization and without good people even the best equipped unit will fail. As I said up front, my travels have been limited, but I have never seen a more educated, motivated, and dedicated group of young professionals. No matter what the task, each individual is eager to accomplish it. A unit's mission will suffer if each person is "doing his own thing." That's not what I've seen in SAC. We are a team and the atmosphere of teamwork and cooperation permeates the Command resulting in our ability to meet any mission demand head on.

Finally I would like to address the Command's effort to decentralize authority—making authority commensurate with responsibility. As I have pointed out, our people have unlimited talent and we must tap their potential by decentralizing authority. We will continue to encourage and foster excellence and our focus is to place responsibility and authority in the hands of those at the working level who have the knowledge and enthusiasm to do the mission. Giving our people the authority, the responsibility, and the resources to do their jobs, maintaining short lines of communication and holding people accountable for results will help provide for a more efficient and effective command.

SAC's capabilities and professionalism have earned you a well deserved reputation. As your Chief of Staff I will do all I can to maintain that reputation and I encourage each of you to **press on.**★★

FLARE

Combat Crew

Magazine of the Strategic Air Command — 37th Year of Publication

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ON OUR COVER

As winter approaches the reliability of weather forecasts decrease. The actual arrival weather rarely matches the forecast. Are you prepared?

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FEATURES

All Dash Ones Are Not Created Equal 4

RCR-09, "Stop Safe" 8

Saint Elmo's Fire (Fact Or Fiction) 10

Crew Coordination 16

DEPARTMENTS

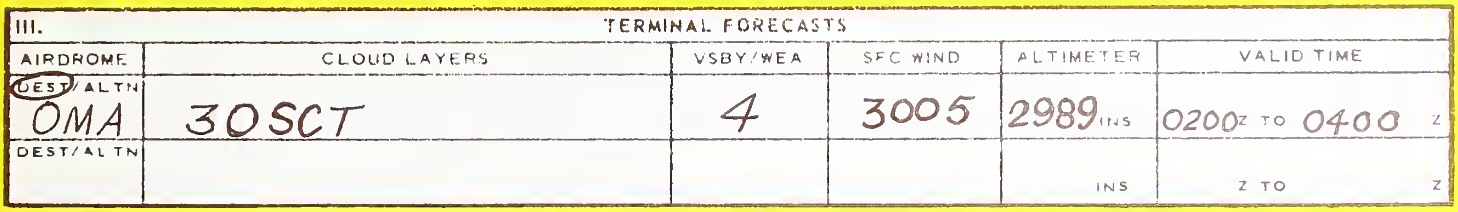
SIFC 12
Cutting Edge (Drive to Arrive Alive) 18
Professional Performers 24
SAC Safety Screen 27

NEXT MONTH

Alcohol and Flying . . .

All Dash Ones are not created equal

This mishap lesson occurred years ago but the message still remains.



III. TERMINAL FORECASTS

AIRDROME	CLOUD LAYERS	VSBY/WEA	SFC WIND	ALTIMETER	VALID TIME
[✓ DEST]/ALTN OMA	30SCT	4	3005	2989 INS	0200Z TO 0400 Z
DEST/ALTN				INS	Z TO Z

The -135 crew received a weather briefing which forecast their return weather as 3000′ overcast, four miles visibility. It was a routine local sortie, nothing to get excited about, even though it was the crew's first sortie in three weeks. The weather appeared to be cooperating which doesn't happen very often in the winter.

Preflight and takeoff went pretty good considering there were a few cobwebs to dust off. Fortunately it wasn't a checkride since none of the checklists were completed as they appear in the book. The aircraft commander had reminded the crew, while they were still in base ops, that the best learning takes place in the first 45 minutes of the sortie. That's the time you see how much you really remember.

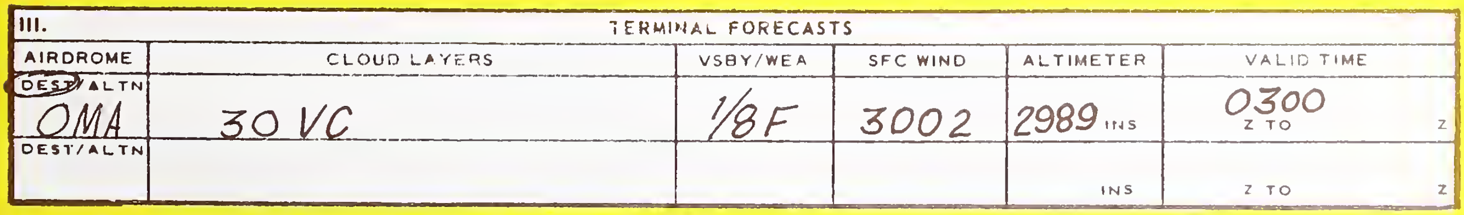
Refueling was pretty standard. Without any weather to worry about, the aircraft commander honored the receiver's request for 10,000 more pounds of fuel. After completing refueling, the pilot called for weather. Based on a reported weather of partial obscuration and three miles visibility, the AC elected to fly the high penetration to an ILS approach.

Back on the ground the SOF saw the weather getting worse by the minute. He wasn't surprised when ground called the ceiling and visibility zero zero. On final the aircraft commander was surprised to hear the SOF sending him around just as he was approaching decision height. He slowly and deliberately started the missed approach while scanning outside to see if he could pick up the runway. Slightly below glideslope he saw the strobes flashing to his right. He continued his missed approach and called the SOF to tell him he was going to try it again. At first the SOF hesitated, but on learning the aircraft was now below divert fuel figured it was worth the try. On final the aircraft commander stayed slightly below glideslope right on course. At decision height he faintly saw the strobes and increased his descent rate so he could break out before he had to go around again. The aircraft contacted the ground 4,280 feet short of the touchdown point, struck a building and a telephone pole, bounced, and finally crashed on the overrun. All personnel escaped from the aircraft which was destroyed by fire.

As I read the report, I asked the same question every crew member asks. How can the arrival weather be so different from the forecast? Given the weather personnel are outstanding, their product, my 175-1, is only as reliable as the inputs available to them: What are those inputs; what are their limits; and lastly, what can aircrews do to help both themselves and the weather personnel serving them?

My hope in this article is to share what I've learned so that we, aircrew members, can better evaluate our weather forecasts for both local missions and especially trips to strange fields, and then safely plan accordingly.

If you are headed to a different destination, your forecaster may choose to work with any three types of obser-



III. TERMINAL FORECASTS

AIRDROME	CLOUD LAYERS	VSBY/WEA	SFC WIND	ALTIMETER	VALID TIME
[✓ DEST]/ALTN OMA	30 VC	1/8 F	3002	2989 INS	0300 Z TO Z
DEST/ALTN				INS	Z TO Z

vations in compiling your "Dash One." An Aviation Weather Report (AWR) or its equivalent is issued by stations hourly and on a "special" basis as required. Through the use of computer terminals, teletype, or telephone, the forecaster will either call your destination direct or tap into the data bank stored at Carswell AFB, TX, and the Automated Weather Network (AWN). Together, the two receive observations from US and foreign, military and civil fields.

Your forecaster may utilize two other forms of observations: the familiar pilot report (PIREP), and the hourly or "special" radar report (RAREP). RAREP's provide information on precipitation patterns, area coverage, height, intensity, and movement.

While observations report information on what is happening "right now," and may provide a good starting point, you are concerned with the forecast for your arrival time. If your destination is elsewhere, your forecaster can again tap into the AWN via the Carswell data bank for a Terminal Aerodrome Forecast (TAF) or equivalent; or he may elect to contact your destination direct for the same. As with the AWR's, the Carswell data bank contains TAF's for US and foreign, civil and military fields. Locally the forecaster can access numerous reporting stations that will help paint a more accurate picture.

Observation and forecast coverage varies widely from field to field and is by no means complete. Some fields have 24-hour weather reporting services, while others run a part-time operation. When fields do not have full-time weather services, the forecaster will have available several quality AFGWC products to make a forecast for your destination or he or she may draw upon a TAF generated by an airfield in the vicinity of your destination.

In the absence of destination station observations and/or forecasts, your forecaster may elect to use observations and forecasts from stations surrounding your destination. The extent to which surrounding stations can adequately reflect present or future conditions at a destination depends to a great extent upon topography. That's where a local forecaster has a slight edge. He has watched storms and fronts move through the local area many times before. All of us have stories to tell of two fields separated by no more than a few miles, one well within limits, the other well out of limits, be it for winds/RCR, ceiling and visibility, turbulence or hazards. The forecaster will review the data from other stations to determine a forecast for your destination. Of course, if the situation dictates, a forecast for a suitable alternate will be provided. Your foreaster should reference other sources as well. Satellite photos may or may not be available at your point of departure. If available (the majority of weather stations now have them) all certified forecasters have been trained in satellite interpretation and can provide invaluable assistance to the aircrew.

Each of the sources referenced by your forecaster has one common denominator: your forecaster. His or her role is one of synthesis and interpretation. The forecast itself is nothing but a projection of the current trend of the weather producing factors. "If that cold air mass keeps moving at that rate we will have fog in here by midnight." Any number of things can change to affect the weather down the road. If the mass stalls or picks up speed the original forecast becomes invalid. The forecaster draws on experience and training to transform raw data and interpret the trends into a complete 175-1 for you and I, the aircrew. A critical player.

With this discussion in mind, what can we do to help ourselves and lessen the likelihood of surprise weather at destination?

First and foremost, know your inputs. Make a note of what the forecaster is basing the forecast on. Understand the interpretation process. If the forecaster expects the front to move rapidly and your information shows it isn't, you can expect the forecast will not occur as quickly as planned. Make sure you don't just hear what you want to hear. Some crews keep asking questions until they hear the answers they want to hear. Consider the limitations discussed so far. Do not accept the "Dash One" at face value; have a "feel" for it and don't base critical assumptions on best case scenarios.

Know your inputs, ASK. Check to make sure your intended course is still valid.

Once airborne, continue to help yourself. Use your Pilot to Metro Service (PMSV). AFM 51-12, Vol II directs the "PMSV will be used to the maximum extent to update forecasts and obtain latest weather observations." It goes on to point out "world-wide PMSV facility locations, frequencies, and instructions are published in the appropriate enroute supplement." Whether you have HF, UHF, VHF, FM, or any combination thereof, once airborne and throughout the flight, keep up-to-date on weather. This is all the more critical should the inputs to your "Dash One" be few, marginal, or otherwise suspect.

Lastly, help the weather folks help us. Give them time to prepare the briefing, call early and be specific with requests. A point much emphasized by the weather folks was the PIREP. Put simply, they want them. AFR 60-16 states, "Pilots are urged to make weather reports of all weather elements whenever possible. Report hazardous weather immediately."

Predicting the weather is a tough job. The professionals in weather shops around the world do the best they can with the inputs they have available. Know these inputs. ASK. Make your own judgment on the 175-1. Help the weather folks help us; give them adequate and specific notice of your request; give PIREPS. Once airborne, keep yourself up-to-date; have a safe flight and arrive alive.

This article was submitted by Capt Robert R. Singleton, 55th ARRS. It originally appeared in Flying and has been adapted for the command. Ed.

Share the Experience

Maj Kevin M. Murphy
416 BMW, Griffiss AFB

The weather was forecast to be **CAVU** for the entire mission. I was glad this wasn't a typical tanker mission. In addition to the unusual air refueling and nav leg my crew was delivering 39 **high power** VIPs to Dover AFB.

Shortly after leveloff the crew began preparations for the scheduled FB-111 air refueling. The refueling was normal but on a couple of occasions I noted a slight rumble, a rumble I attributed to my spanish omelet. I looked around and no one else seemed to notice. After air refueling we began a climb to FL 370 and settled back to answer questions from many of our guests. The cockpit was busy with people asking questions, taking pictures and just trying to get a **look-see** about flying a KC-135. An hour had gone by and I noted that there was once again an annoying vibration in the cockpit. I waited for it to occur three or four times to be sure I wasn't just being oversensitive because of our passengers. I asked the crew members if they could feel anything. "No," was the universal reply. Now I was uneasy; something wasn't right but I could not put my finger on what it was, and worse, I seemed to be the only one who was noticing it.

Suddenly there was a series of bangs, somewhere near the cockpit. I looked around—everyone was noticing now. As fast as the bangs came they were gone, along with the vibrations. Then it was back again. Once again the banging stopped, but this time the vibrations continued. The gentleman in the jumpseat remarked, "The vibrations are like driving over a washboard road," and "The banging sounds like someone is doing body work on your jet." I replied, "I'm sure it's nothing more than a loose nosegear door, nothing serious." With the noise and vibration becoming more noticeable, I decided that it was time to develop a plan. First, I needed to remove six to eight inquisitive VIPs from the cockpit. The major from Offutt AFB escorting the group did a great job of helping out. Next, I asked the boom operator to look in the lower nose compartment. I thought for sure he would tell me that a nose gear door was open (even though we didn't have a gear light). The boom returned and said that all was normal but he could hear and feel the noise very well in the **hell hole**. I looked at my navigator and asked for the range to Grissom and Wright Patterson. Grissom was farther but we needed the time to get down, run checklists and determine our problem. The plan was to level the aircraft at 15,000 feet AGL and perform a controllability check. As we slowed the aircraft to configure and check out the flying performance, the vibrations began to abate. During this time the command post was offering some useful information as was Grissom's senior staff. The aircraft made a normal approach with gear and flaps 40 degrees, and so we elected to continue on to Grissom. At this point, I need to add that we had lost the N-1 and J-4 compasses, the DNS and the INS. The navigator's radar was unreliable so we asked center for no gyro vectors to Grissom. Once we contacted Grissom approach control we elected to fly a no gyro par as the weather would not allow a visual approach.

On final, with the runway in sight, I elected to do a low approach so that the SOF and DO could look us over. Everything appeared normal and the subsequent landing was uneventful. Once on the ground, Grissom's maintenance personnel did an excellent job of finding our problem, a defective radome. Maintenance people have since told me that the radome had from 10-30 minutes of life expectancy left.

A hearty **well done** to the Grissom personnel who helped us. It was only our crew's second flight together but I thought they reacted quite well.

Lessons learned? If you don't like the way a jet is acting—park it! No one will question an aircraft commander's decision if he uses good judgment.

Finally, after you're on the ground, share your story and let others learn from your experience. **FLY SMART. FLY SAFE.**

RCR 09, “Stop Safe”

Maj Gary W. Smith
306 SW

The instrument approach looked normal, just like hundreds of others Foxtrot had watched over the years. Touchdown appeared normal too as he watched the speedbrakes rise just after the nosewheel touched down. Braking action seemed normal as well, as he watched the RC-135V pass by. As he turned the SOF truck away from the flightline, he heard the first call to control, followed swiftly by another, only more urgent, “Control, we’re off the runway, **WE’RE OFF THE RUNWAY.”** Visions of his career flashed before his eyes as he drove down the taxiway to the overrun. There was the RC-135, about 800 feet down the stressed overrun with his nosegear and left main truck six to ten feet off the hard surface in the mud. Happily, no one aboard was injured and no damage was done to a very valuable airframe.

His SOF tour had started with the usual weather briefing. Snow was very lightly falling as it had been since noon, but none was accumulating because the temperature was above freezing. The weather forecast was for more of the same, no accumulation, and conditions slightly improving as the afternoon progressed. Except for the RC-135, scheduled to land about 2100 local, his last aircraft had landed at 1500. Occasional checks during the afternoon and early evening revealed continued dry runway conditions and no snow had accumulated by 1900 local as he came back from getting a bite to eat.

At 2040, Foxtrot heard Bongo 55 call control and state that he would be in the chocks at 2105 local with 29,000 pounds of fuel on board. As Foxtrot drove toward the flightline, he saw the snow **was** starting to accumulate on the taxiway and runway, but it was patchy with one-fourth inch or less accumulation. He called control and asked for the latest RCR reading. Control told Foxtrot the runway was still being called "dry," but that an RCR check by Base Ops was in progress. Questioning the "dry" call, he switched over to tower frequency and asked for the latest RCR information. The tower controller stated, "loose snow on the runway, RCR of 11." Foxtrot switched back to control and asked for that information to be relayed to Bongo 55. Bongo 55 acknowledged the RCR call and a moment later asked for a further update. This time Foxtrot switched back to tower and asked for both the RCR and the latest winds. The tower controller now said, "Winds calm, loose snow and ice on the runway, runway RCR of 11 and overrun RCR of 09. Foxtrot passed this update to Bongo 55 and again he acknowledged as he continued the ILS approach.

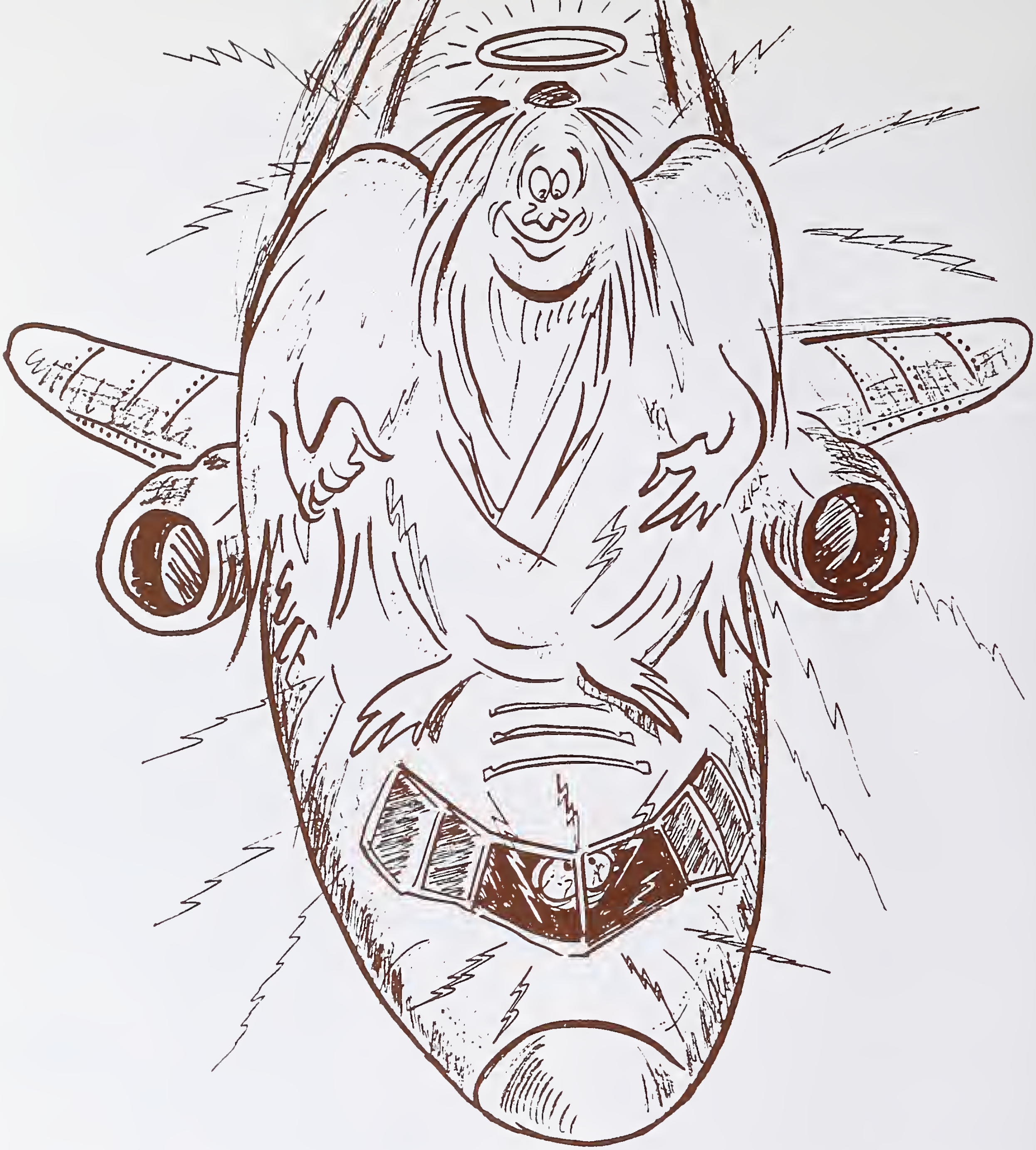
There are many lessons to be learned from this "runway excursion" incident, both for aircrews in general and for Foxtrots as well. The first lesson concerns landing ground roll. Bongo 55 had computed a landing ground roll based upon a "worst case" (how many of us usually do that?) of a wet runway with an RCR of 09. Per tech order performance instructions, the crew routinely figured an RCR of 09 for a wet runway. When landing on a slurry sealed (porous friction) runway with a "wet" RCR of 09, you have a totally different (much better) condition for stopping than with a true RCR of 09 and snow and ice (a surface condition) on the runway. Since the RCR called was 11 (better conditions than their worst case), this didn't trigger an alarm in the minds of the pilots aboard Bongo 55. At an RCR of 09, their computed ground roll was 7800 feet. Since we routinely back-taxi and use 1000 feet of overrun as our local takeoff procedure, the crew was thinking of the **takeoff** value of runway available as 10,240 feet. For landings, though, the runway available is actually 9,240 feet.

Here's the first question for the pilots. To achieve the charted ground roll distance from the performance manual, what kind of braking technique is required? If you said anything other than "full wheel brake application," you're wrong. Of 16 pilots and instructor pilots questioned after the incident, only four gave the right answer. The other 12 felt it was something less than full wheel brakes (maximum brake pedal application). How did you answer? Several seasoned IP's performed an official inquiry and felt that the required brake application technique was probably a widespread misconception throughout the 135 fleet (hence a good reason for this article).

Here's the second question for the pilots. How many of you really compute a flare distance and add it to the ground roll to get a feel for the "total" runway you're going to use in order to stop. When 1900 feet of flare is added (the CAUTION says variation in touchdown point and/or operating technique may possibly increase landing distance by 2500 feet), Bongo 55's approximate runway used to stop should have indicated they would stop approximately 500 feet into the stressed overrun.

The lesson to be learned for Foxtrots is to try to become as familiar as possible with the landing capabilities of the various types of aircraft you will be expected to "supervise" (KC-10, B-52, E-4, KC-135 A/E/R, etc.). What looks right and sounds reasonable? If a 135 can barely stop in the runway available, how can a heavier B-52 do it? Although Foxtrot can't make the final decisions for the crew, he can ensure the best information is passed to the crew. If something doesn't seem right, ask the crew to doublecheck their work. "Smart cards" or "plastic brains" can help provide good general knowledge to each SOF; the ultimate responsibility lies with the crew. This was an inexpensive lesson in terms of injury and aircraft damage. It proves, once again, you can't relax until the job is done. **Fly Smart. Fly Safe.**

P.S. For all of you KC-135A performance "experts" out there, here's one final question to consider. Let's say an A model (105,000 operating weight) loses its right hydraulic system (no crossover possible) and you have to manually lower the flaps to 30 degrees. You're returning to a dry runway of 9,240 feet (calm winds, temperature 30F, PA 0', Grade 0) and you're told to dump fuel down to 30,000 pounds for landing. Can you stop in the runway available? Figure worst case conditions, i.e., no speed brakes, rudder power off, no leading edge flaps, etc. Will you make Foxtrot's career flash before his eyes? Did you remember to increase your landing ground roll for a 6-knot increase for no leading edge flaps (two and one-half percent per knot)? Did you consider **flare distance**? What delayed braking factor did you use? Fly safe and STOP safe! Remember the mission's not over till you're safely parked (and the paperwork's done).



Saint Elmo's Fire: Fact and Fiction

Capt W. H. Stimpson
416 BMW, Griffiss

I remember it just like yesterday. There I was. . .a brand new pilot fresh out of Castle and my eleventh B-52 combat training mission. We were in the weather at night and descending into low level when I saw it. A bright greenish blue flame suddenly emanated from the number one window. Immediately, I thought something was shorting out or burning. I quickly told the AC that something was wrong, but to my dismay, the AC chuckled and said, "Don't worry, that's only St. Elmo's Fire." That was my first encounter with St. Elmo's Fire; on several occasions since I too have turned to the new pilot and said the same thing.

A unique and fascinating phenomenon, St. Elmo's Fire is named after the patron saint of Mediterranean sailors who protected his warriors. During thundery weather, masts of ships, yardarms, and even rope would glow as if on fire, but yet this fire would not burn. At times the fire would dance from mast to mast accompanied by a crackling sound like that of twigs breaking or burning.

We now know it as St. Elmo's Fire, but English sailors called it corposant, from the Portuguese word corpo-santo meaning "holy body." Sailors were mystified and awed and believed that a holy presence was enveloping their ship. Others believed it was the souls of dead seamen coming to warn them of an approaching storm. Modern names include corona and brush or point discharge.

But what is St. Elmo's Fire exactly and how is it formed? Basically, St. Elmo's Fire is a form of electricity. The electricity with its associated bright glow is produced when negative charges drain away and positive charges remain. An aircraft flying through charged clouds produces this type of effect. As the aircraft moves through the air the charges continue to build until they reach the point of discharge. Usually the pointed surfaces of the aircraft will begin to glow first. A charge will collect more strongly near a point since the point is more distant from the rest of the charges.

Now that you know how St. Elmo's Fire is formed, I bet you're wondering if it can be dangerous to aircraft in flight? The answer to this question is both yes and no. There have been numerous cases of airplanes engulfed in this fire with no ill effects, but in other cases the electricity has damaged electronic equipment. Sometimes accompanying the discharge is a form of radio interference called precipitation static (p-static). This type of static is extremely annoying since it interferes with normal radio operation and other electronic devices, and can seriously damage both radio and navigation equipment. The static intensity increases with aircraft size and speed. A B-52, with its large mass, is very susceptible to p-static as it moves quickly through the air. There are devices designed to lessen or prevent this type of static called static point discharges. They are placed on the trailing edge of the wing or tail surfaces. Their physical makeup is a carbon impregnated wick, frayed at the end to make contact with the air. High speed jet fighters usually have no problem with p-static. The exhaust produced by the engines carries away most of the charge which accumulates on the aircraft in flight.

> **"Sailors were mystified and awed and believed that a holy presence was enveloping their ship. Others believed it was the souls of dead seamen coming to warn them of an approaching storm."**

In many instances, St. Elmo's Fire is not directly dangerous to aircraft, but in many circumstances it will precede static discharges or lightning strikes by five minutes or more. It serves as a warning to pilots that the environment is electrified and a static discharge could occur. If lightning does strike the aircraft it will usually pass along the greatest distance, that is, from nose to tail or wingtip to wingtip. Either way, lightning carries a charge of several hundred million volts, a current of 20,000 amperes and superheats the air at 30,000 degrees centigrade, so it packs a good punch. Lightning strikes have caused serious and extensive damage to all types of aircraft. If St. Elmo's Fire is allowed to continue and build up, by not exiting the area, it can lead to a static discharge. Such static discharges can cause minor to serious damage to the aircraft.

The most direct effect of St. Elmo's Fire is on aircraft pilots. Many times the light and glow produced by the fire is so bright that it takes away the pilots' night vision. Short exposures to bright glows and flashes may render the pilots as good as blind for many seconds.

As you can see St. Elmo's Fire may or may not be dangerous. The proper preventive action is to exit the area of its occurrence. If this is the case, where does St. Elmo's Fire occur? As discussed earlier it usually occurs in and around thunderstorms. It also is found within eight degrees centigrade and 5000 feet of the freezing level, in light precipitation, in clouds, and in areas which contain concentrations of solid particles (ice, dust, etc.). Continued flight in such areas will allow the charges to build on the aircraft until they reach the point of discharge. At that point, St. Elmo's Fire, a static discharge, or any combination of the two could occur.

Now that you know the facts and physical events which surround this phenomenon, what can you do to avoid and prevent it from happening? The proper action is to stay away from those areas where it will occur. That means avoiding thunderstorms, since they carry some of the most deadly weather known to man. There is no peacetime mission that requires penetration of a thunderstorm except for a Majcom-approved mission. When flying at night in the weather, periodically check your outside air temperature gauge and see how close you are to the freezing level. If you are near it and you can alter altitude, get out. Avoid areas of high precipitation and ice. Now there are times when some conditions just can't be avoided, but if St. Elmo's Fire does appear and conditions deteriorate, leave the area. You can always come back another day.

Yes I know, there are a lot of you out there who have encountered St. Elmo's Fire and never had anything happen. I, too, have seen my whole airplane engulfed in it and never had anything happen either, but that's not the point.

Always be prepared for the unexpected. The next time you're flying on a dark moonless night, and fire begins to dance on your windscreen, be alert because no matter how fascinating and mysterious St. Elmo's Fire seems, it can be dangerous. So watch out and **fly safe, fly smart.**

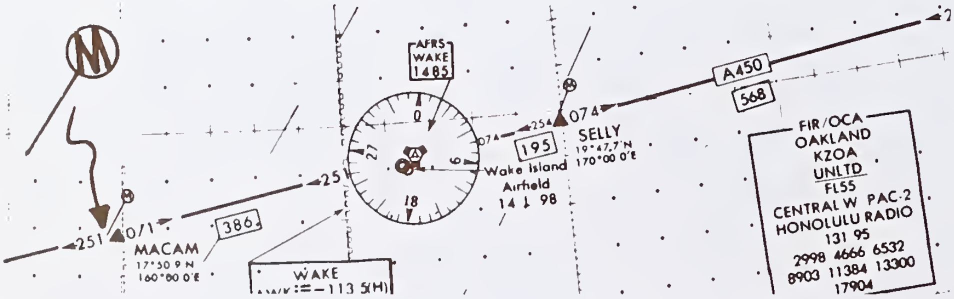
About the author. Capt Stimpson is an aircraft commander on Crew R-27 assigned to the 668 BMS, Griffiss AFB.

TDY at Last

Capt Pete Katsufrakis
SIFC

The crew has finally made it to the top of the TDY list. A choice overseas deployment is in the cards and you are in the midst of preparations when your new aircraft commander (formerly your pilot) asks what flying outside the CONUS is like. There are two areas you are going to want to address: operations in both international and foreign airspace. Let's start off with a definition of international airspace. According to FLIP General Planning Chapter 7, "the sovereignty of a state extends beyond its land area to the outer limits of its territorial seas. The United States does not recognize territorial claims in excess of 12 NM. The airspace beyond the territorial sea is considered international airspace where permission of the coastal state is not required for overflight and related military operations." Simply stated, once you are over the ocean and 12 NM from the coast you are governed by the rules of the International Civil Aviation Organization (ICAO), and not the rules of the country. However, rules of ICAO are binding on civil aircraft only. DOD regulation 4540.1, the Foreign Clearance Guide and FLIP state "it is United States policy to comply with the rules of ICAO in international airspace, except when compliance would not be in the best interests of the United States."

There are four categories or exemptions when military aircraft are allowed to forego the rules of ICAO. These categories are: military contingencies, classified missions, political necessity, and mission accomplishment. The first three are relatively self-explanatory, but a word of caution must be given when considering mission accomplishment. This should only be used when there is no other way to accomplish the mission. For example, thunderstorms have kept a large group of tankers and bombers from getting on the air refueling track until close to the end. Unless "due regard" is evoked there will not be enough time on track for all aircraft to get the gas necessary to accomplish the mission. Mission accomplishment is not to be used to head back to base while waiting for the clearance to do just that! When the aircraft is in one of these categories it can forego ICAO rules and its operations will be under "due regard" or "operational." The phrase "tactical" is not recognized as meaning the same as "due regard" and should not be used in communications with air traffic control. If your mission is in these categories and you must operate "due regard," the aircraft must also meet at least one of the following conditions: the weather must be VMC; or the aircraft must be operated within radar surveillance and radio communications of a surface radar facility; or be equipped with airborne radar that is sufficient to provide separation between themselves, aircraft they may control and other aircraft; or operate in uncontrolled airspace. "Due regard" requires the aircraft commander to act as his or her own ATC, separating the aircraft from all other air traffic and assuring an appropriate military authority assumes responsibility for search and rescue. Which brings up the point that "due regard" puts you on your own with no requirement to make your position known to the world (except as required by AF/SAC regulations), and sometimes that is exactly what we want.



When you are going to mission plan a delay and use the "due regard" option, such as a sea surveillance mission, there are a few things to consider. By filing a delay point, then a point at which you will "resurface" at X hours later, you are ensuring ATC knows you want to resume flight on an IFR clearance after the delay. Accordingly ATC will hold your IFR flight plan open. Your IFR clearance at takeoff takes you only to the delay point. You must obtain a new IFR clearance once complete with the "due regard" portion of the flight. Before declaring "due regard" ensure you coordinate a "pop-up" frequency and know what ATC unit you are to contact when you are done with the delay. There's nothing worse than coming off of the delay with no one to talk to. If you find yourself in this situation use every available means to get your IFR clearance to include UHF/VHF guard to other aircraft for assistance or even a phone patch to ATC through GIANT TALK. It's happened before that an aircraft finished "due regard," could not talk to an ATC unit and found itself facing IFR conditions in controlled airspace with no surface radar or AWACS to keep it safe. We've heard of the "Big Sky Theory," but ask anyone who has operated over the ocean for a few years and they'll have at least one story about meeting another airplane where there wasn't supposed to be one.

One last thing about "due regard;" if you simply declare it without providing any kind of delay or providing a point at which you'd like to resume an IFR clearance, your flight plan will be dumped. So, if you have to declare "due regard" to accomplish the mission, ensure you coordinate to have the flight plan left open. Armed with this information you can avoid embar-

AP/3

AP/2

AP/1

GP

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rassing yourself by attempting to operate "due regard" over France or Mississippi.

Another overwater subject of confusion is position reporting. In Section B of the Flight Information Handbook (FIH) there are three types of position reporting each with a different application. The first is FAA position reporting which is to be used in US sovereign airspace. The second and third types are ICAO and OCEANIC. We will limit our discussion to ICAO and OCEANIC reporting. ICAO position reporting is used over international waters when out of radar contact and when verbal reports are required over foreign countries. These reports are made on published routes at significant or designated points, or on RNAV flight plans starting the first half-hour of flight and each hour thereafter (ATC can designate shorter intervals). In certain cases this report must be given as an Air Report (AIREP), which includes meteorological data. To find out if you must give an AIREP you will need to consult FLIP AP 1, 2 or 3 under position reporting for the appropriate ICAO Region (i.e., Europe), Flight Information Region (i.e., London FIR) and nation (i.e., United Kingdom). These sources will show any changes to ICAO procedures and if meteorological data must be reported in these areas. Regardless of this information, an AIREP must be given if the aircraft encounters severe icing and/or severe turbulence. When flying on published routes the symbol (See Fig. 1) at reporting points shows that an AIREP must be given. In addition, ATC may designate your aircraft to report or not report meteorological data based on its needs and traffic flow. Certain portions of the AIREP may not be required of your aircraft so consult the FIH for the format and terminology before submitting one. Consult the SAC OPS Reports for the current requirement to record and report weather to SAC stations. OCEANIC position reporting is used south of 45 degrees North latitude in the North Pacific Region where the US has ATC responsibilities. This specifically applies in the Oakland, Honolulu, and Guam Control Areas. North of the area OCEANIC type reporting in US controlled airspace is optional, ICAO can be used. In the OCEANIC area of applicability, predominantly East-West flights give fixed line position reports every five degrees longitude, or 10 degrees if the aircraft travels this distance within one hour and 20 minutes. For predominantly North-South flight, again five or 10 degrees based on latitude and time to travel. Special missions such as SAR, anti-submarine, etc., may have an operational reporting format and ATC must be advised of this. Thus, when off routes in the defined area in the Pacific no meteorological data must be reported, however, it is a good idea to report severe weather such as icing or turbulence. On fixed routes such as the Composite Route System between the mainland and Hawaii, meteorological data must still be reported at the designated points.

My final point on position reporting is that there is often no radar tracking you. Accurate navigation and position reporting are critical. A revision to the next position time must be made if it is in error by three minutes or more. Simply get ATC's attention by transmitting for example, "Honolulu, Bongo 52, revision." When they come back to you give them your next position and revised time. It will help them accurately control the flow of traffic. For a further look at the effects of navigation errors, consult the SIFC Crosscheck article "Don't Be Gross" in the August 1986 Combat Crew. Next month we'll take a further look into flying overseas, what to prepare for and where to find the information. Until then, **fly safe, fly smart** and if you have any questions, give us a call at 347-4571.

A Safety Paradigm*

1Lt Robert S. Hopkins
24 SRS, Eielson AFB

*PARADIGM: Any example or model.

This article is not intended as a carte blanche to make up new and capricious procedures to replace those already in the Dash One, nor is it intended to replace the current abort warnings in the -135 series Dash One. Hopefully, this article can offer insight into how, while still safely on the ground, we can critically examine each Dash One procedure and ask "What conditions could alter or invalidate this procedure?" Finding those conditions, how then can we best handle the situation.

An essential part of being a fully capable, professional crew member is the ability to swiftly and competently react to emergencies. The Dash One provides guidance for the handling and resolution of a wide variety of situations, both abnormal and critical.

It would appear that it's a simple matter to memorize boldface or recall cookbook procedures to correct malfunctions and then to land the jet safely. Unfortunately, not all situations are covered in the Dash One. Instead, the aircrew is directed to rely upon sound judgment in handling contingencies. How do you acquire this judgment?

Let's consider a situation that occurs on every flight: takeoff. The conditions we consider and the emergency which ensues will put us square into a "gray area" in terms of Dash One procedures. Then we can consider all aspects of the problem, before it happens, to critically evaluate potential responses, and incorporate this reaction into our own "flying data bank."

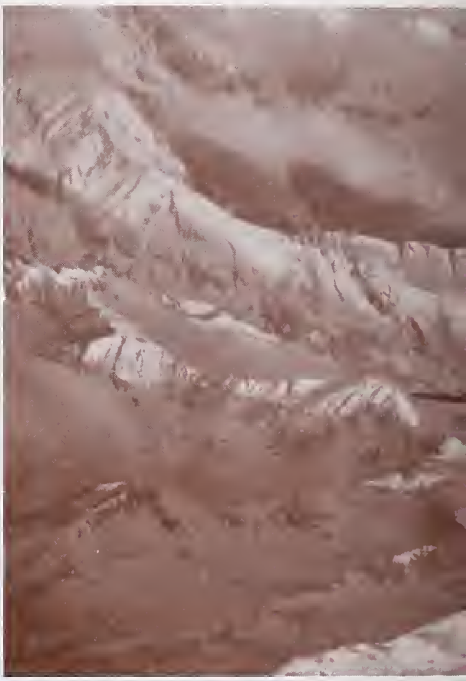
This "safety paradigm" is applicable to any aircraft, can be applied to any situation, and can be discussed during a hangar flying session or over coffee while on alert, where references and resources of other crew members are readily available.

Setting the Stage

While assigned to the Alaskan Tanker Task Force, you're flying a Busy Relay sortie out to "The Rock"—Shemya AFB. Landing weather is good: a chilly 27 degrees, 3500 feet broken visibility seven miles, runway dry with no reported precipitation, and winds with 15 knot gusts across the runway. On board, in addition to your crew of four, are the Shemya-qualified instructor pilot and two passengers. The crosswinds made the landing a real challenge, but following a firm touchdown on centerline, the aircraft braked normally and decelerated to taxi speed halfway down the runway.

Following engine shutdown, you head off to see the Shemya National Forest and to stalk the wild Coke bottle. Prized bottles safely in hand, it's now time to head back to Eielson. Weather remains the same, and the runway is still dry. A rarity for Shemya, it's a great day for a little work in the VFR pattern prior to departing.

The pilot figures and posts takeoff data. During taxi, you brief the data and emergency procedures. "OK crew, if you see anything abnormal prior to S-1 tell me what it is and I'll make the decision to abort. After S-1 keep the problem to yourself. We'll get the airplane flying and deal with the emergency once we're safely airborne and flying the jet. Any questions. . .?"



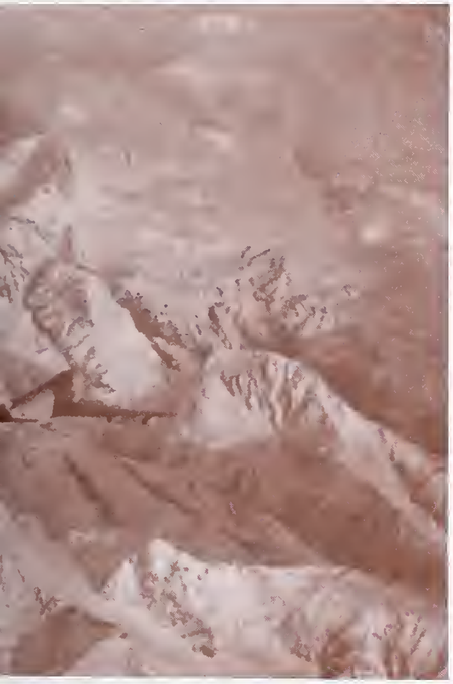
Tower clears you for takeoff with a gusting left cross wind. The pilot fine tunes the EPRs; four good engines and you're rolling. Ninety knots and the airspeed indicators crosscheck. The gusty crosswinds are really testing your ability to keep the airplane rolling down the runway centerline!

The pilot calls "S-1" and you focus on maintaining aircraft control. Moments later you hear a loud bang and experience deceleration and yaw to the right. The number four engine fire light illuminates and the engine instruments indicate the engine has seized. The number four hydraulic pump inoperative light is also illuminated.

What will you do?

The answer seems easy. The Dash One says that "takeoff will not be aborted after S-1 unless, in the opinion of the pilot, the emergency renders the airplane incapable of flight (loss of thrust exceeds the equivalent loss of one engine). In those cases where an abort is attempted after S-1, be aware that the airplane will probably fail to stop within the confines of the runway."

In this case the aircraft is capable of flight according to the Dash One definition—you've only lost one engine, although it has seized and is providing no residual thrust.



Let's look more closely at the rest of the situation, what the Dash One says, and how a good understanding of the flight manual combined with your situational awareness can provide a safer, more viable solution to this emergency.

The Art of Self-criticism

Review each of the two portions of the S-1 abort warning and see if they work in every case. Since the loss of thrust does not exceed the equivalent loss of one engine is this our only criterion for an abort after S-1?

You've lost a downwind engine. The airplane will now yaw and roll into the downwind side. Remember those high, gusty crosswinds? The Dash One states: "When moderate to high crosswind conditions exist and lateral control is used to maintain wings level during takeoff. . . if a downwind outboard engine fails (after S-1), additional lateral control input, applied toward runway centerline, may be required during recovery."

So you've got more control deflection to maintain aircraft control—which means more drag and an increased need for higher airspeed to become airborne, which could mean a later than planned rotation. Although there is no obstacle here, our "safety paradigm" is sufficiently generic to apply to any runway environment, including one with a pronounced obstacle clearance problem, which would definitely be affected by delayed rotation.

What about that hydraulic pump inoperative light? In this case, the seizure and explosion of the engine not only eliminated that engine's thrust, but destroyed hydraulic lines and pump as well. In the short time on the runway prior to rotation the loss of hydraulic fluid would not be noticeable, but would become painfully apparent after the aircraft is safely airborne.

Gone is the powered rudder which can become critical in maintaining control. The outboard spoilers, essential in slowing the aircraft during the landing roll are also gone. So while the aircraft is still capable of flight, the landing will certainly be under poor conditions. The idea of flying to a suitable alternate with better landing conditions—nearly two hours away— is certainly inadvisable.

Although the aircraft can still fly safely, other conditions suggest that an abort is preferential.

Reviewing the Data

But what about the second part of the warning—"The airplane will probably fail to stop within the confines of the runway"? After all, it's nearly 100 feet down to the cold black Bering Sea, awaiting whoever uses more than 10,006 feet of runway. You certainly can't help but be worried about that and it definitely influences your decision to abort.

Or should it?

Let's think back to the days of pilot training when our instructor was grilling us about Category I, II, and III takeoff conditions. We'll assume that our S-1 speed is defined by Critical Engine Failure Speed (CEFS), and is not influenced by any other conditions.

In Cat I, the critical field length is less than the runway length. This is ideal for an abort situation. For Cat II, the critical field length is the same as the runway length. Cat II leaves no margin for error. Finally, in Cat III, the runway is shorter than the critical field length, and aborting after S-1 will put you in cold water!

Sounds like the second half of the S-1 abort warning from the Dash One, doesn't it? While the warning may not

cont'd on page 26

"Viper 22 flight, contact Sidecar on 234.7; squawk 3235; cleared to center frequency; thanks for the work."

"Roger, Tank 69. Appreciate the gas." The fighters make a graceful turn to the left as we head for home drome and a much anticipated brew at the club.

"Nav, AC. Ready for descent briefing?"

"Roger, AC. Ready to brief the approach."

"OK crew, we're gonna fly the ILS 1 to runway 32. Glideslope intercept altitude is 4000 feet; decision height is 232; the runway is 200 feet wide with A1 standard lighting; rate of descent on final will be 750 feet per minute, etc., etc. . . ."

Can't wait till we get this thing on the ground. We've been down here five days without a day off. You'd think these TAC guys had never seen a tanker before we showed up, the way they want refuelings. No sweat, tomorrow's a day off, and the whole crew is looking forward to a day on the beach soaking up rays.

"Tank 69, Paradise Center. Maintain FL 250 until 30 DME. Cleared ILS 1 to runway 32."

Great, these folks like to keep you up high until the last minute. Never heard of an enroute descent south of the equator, I guess.

"Crew, AC. Gear and boards to get on down."

Whoa, here we go. The tank drops like the proverbial rock as we descend out of 250 for the approach. Time to comply with procedures and set up for an ARDA. Scope 3-3/5, look for the base, set the reticle on the inbound heading. Man, that beer and sunshine is going to feel great. Wait till they get the postcard back at the alert facility.

"AC, nav. Approaching final approach fix."

"Roger, nav. Crew, prepare for full stop."

Crew Coordination

Capt Charles E. Rohr
116 AREFS (WAANG)

Huh? We're 750 feet above glideslope intercept altitude. That's OK; we can get down there in plenty of time. Runway in sight; sequenced flashing strobes beckoning us home.

"Flaps 40, gear and fuel panel checked."

Boy, the picture sure is different at these fighter bases. That 200 foot wide runway looks a lot narrower than our 300 footer at home. Approach lighting shows a different pattern, too. Sure is pretty though. Our first night landing down here. Wish I had brought a camera along tonight.

Man, we sure are coming down fast. Training flight told us about that effect when landing on a runway narrower than what we're accustomed to. Nothing to worry about, though. Our AC has more time on short final than the rest of the crew has in the -135 combined. He'll keep the pilot out of trouble on this approach. This is a good chance for the butterbar to show us what he can do. Between alert and ACE, that poor kid hasn't had many landings lately.

"OK, pilot. Keep the power in and break your descent. Bring the nose up; nose up, I said. I got it."

The silver bird hit the runway in a nose down attitude and careened back into the night air. Boy, are we in for a ride tonight. The pilot is gonna owe us one at happy hour. "Crew, we're going around." The tanker hit again on the nosegear as the AC applied power for a go around. Man, this is getting serious. I've never seen anything like this before.

What's the orange glow outside the cockpit? We're in a world of hurt now. Must've scraped a pod on the second bounce. Yup, there's the fire light on number one. Let's get this airplane on the ground, pronto.

"Crew, AC. Engine fire in number one. Engine fire in flight checklist. Come on pilot, this is no time to get embarrassed about a lousy approach. Get on that checklist."

The whole left wing looks like it's on fire. Forget about the beer; I just want out of this roman candle! The AC nurses the wildly gyrating airplane back in the air and immediately starts a climbing turn to downwind. Looking back over his shoulder at the inferno, the AC fails to notice the pilot retracting the flaps in the turn.

Mother of God, this can't be happening! Tank 69 rolls sharply to the left and the nose pitches up despite the best efforts of the AC to stabilize the aircraft attitude. The horizon is nowhere to be found out the windows. The navigator's last thought before he dies is of his wife and kids.

Does the preceding vignette sound a little overdramatic? Dead men and women tell no tales, but I imagine that a variation on the theme can be played out in incidents involving go arounds from hard landings. Forget about who's to blame, and think instead about the survival aspect of the story.

"Mother of God, this can't be happening! Tank 69 rolls sharply to the left and the nose pitches up despite the best efforts of the AC to stabilize the aircraft attitude."

This article is about crew coordination—that overworked buzzword that evokes a yawn from navs and booms tired of sitting through pilot pros. It is directed at all crew members, pilots and nonpilots alike.

Navs and booms, what can you do to prevent the above disaster and make it home to family and friends? How many of you listen to the pilot brief the vertical velocity on descent and use that information in monitoring the approach? The VVI is easy to see from your station, and it's an early indicator of an excessive descent rate on final. A diplomatic word to the pilots while you're still safely in the air could prevent a catastrophe.

Monitoring the descent rate isn't required by the Dash One, nor is it a gradeable item on a checkride, but it could keep you alive someday. Let's expand the discussion: How many of you are familiar with cockpit switchology? Can you glance at the fuel panel and tell if it's properly configured for takeoff and landing? What does it mean when the pilot is flying an ILS with the TACAN select switch illuminated? Can you tell when the flight start switches are still on after takeoff by the warbling sound in the interphone system? How many of you can do a Form F or takeoff data? The point is this: knowing what the other guy is supposed to be doing at any point in flight might someday save your life. Take the initiative and ask questions. Most pilots are genuinely flattered that you want to know more about their job.

Pilots, how many of you take the time to explain what you're doing and why to the nonpilots on your crew? Briefing the nav and boom to watch for overhead panel lights on takeoff is great, but how about explaining the consequences of misset flaps, spoiler and rudder power cutoff switches, and other potential killer items. When was the last time you put the nav or boom in the jump seat and explained how the flight director system works? Quiz your crew; see if they know where the glideslope indicator is and how to read it. Have you ever thought about having the nav and boom take turns reading the traffic pattern checklist to you on one of those two hour pilot pros?

Navs and booms, get involved. Ask questions about electrical systems, hydraulics, fuel management. Learn the difference between a bus tie and a generator failure light. If you don't understand something, ask. Pilots, motivate your crew and get them involved in all aspects of the mission. Consider taking the boom and nav to your next cockpit procedures training session and showing them various emergency procedures from your perspective.

Crew coordination means a lot more than ARDA's, altitude calls and six ground safety locks stowed. It means growing eyes in the back of your head. It means knowing not only what the other guy **should** be doing, but what he **is** doing. Don't end up a statistic. **Fly smart. Fly Safe.**

Drive to Arrive Alive!

2Lt David C. McCormick
446 SMS, Grand Forks AFB

"Want another cup of java?" my crew commander asked as we headed off to our first alert together at launch control facility Echo-Zero.

"Sure!" I replied.

Before long the bright sunlight was casting considerable glare off the highly polished hood of our crew vehicle. I saw my new crew commander, Capt Littlejohn, nod approvingly as I pulled out my sunglasses. "You'd be surprised how many guys in the squad don't wear those — guess they'd rather subject their eyes to the abuse." My surprise must have been evident; before I had a chance to speak he began a conversation that lasted the entire drive.

"Wanna know how to survive your crew tour in one piece?"

Since I figured he'd be telling me anyway, I responded with a half-hearted "Yeah."

"Develop some sound driving skills, devote your full attention to the task at hand when behind the wheel, and have a plan for those times when you happen upon the unexpected."

"Hang on there, kind sir," I said. "You're talking to a graduate of Horsehead High Driver's Ed and besides, I'm a survivor of all those USAF traffic safety courses."

"Well, there's some things they didn't tell you about driving in the missile field," my MCCC exclaimed. "This driving is probably different than what you've done before."

"I could tell you some interesting stories. . . Like the time Bobby was heading to Alpha-Zero and came over a hill just in time to find an airplane landing in the road. Or the day we had six crew vehicles in the ditch because a light snow covered some killer ice. How about the farm tractor that pulled out in front of Doug and caused a collision. Perhaps the maintenance troop that hit a cow that got through some gate a farmer forgot to close.'

"Okay, so they didn't happen to mention a few close calls crew dogs here have had. What's the likelihood of something ever happening to me? After all this is North Dakota." Capt Littlejohn turned and faced me before he spoke. Something in his voice conveyed the seriousness he evidently felt.

"Let me set you straight on something young deputy! As far as I'm concerned the most dangerous part of our alert tour is the time we spend in this crew vehicle traveling to and from site. If you don't develop some sound tactics for dealing with these local conditions you could end up another ground safety statistic! Personally, I think it'd be a waste of a month's pay to let you find out the hard way, so listen up.

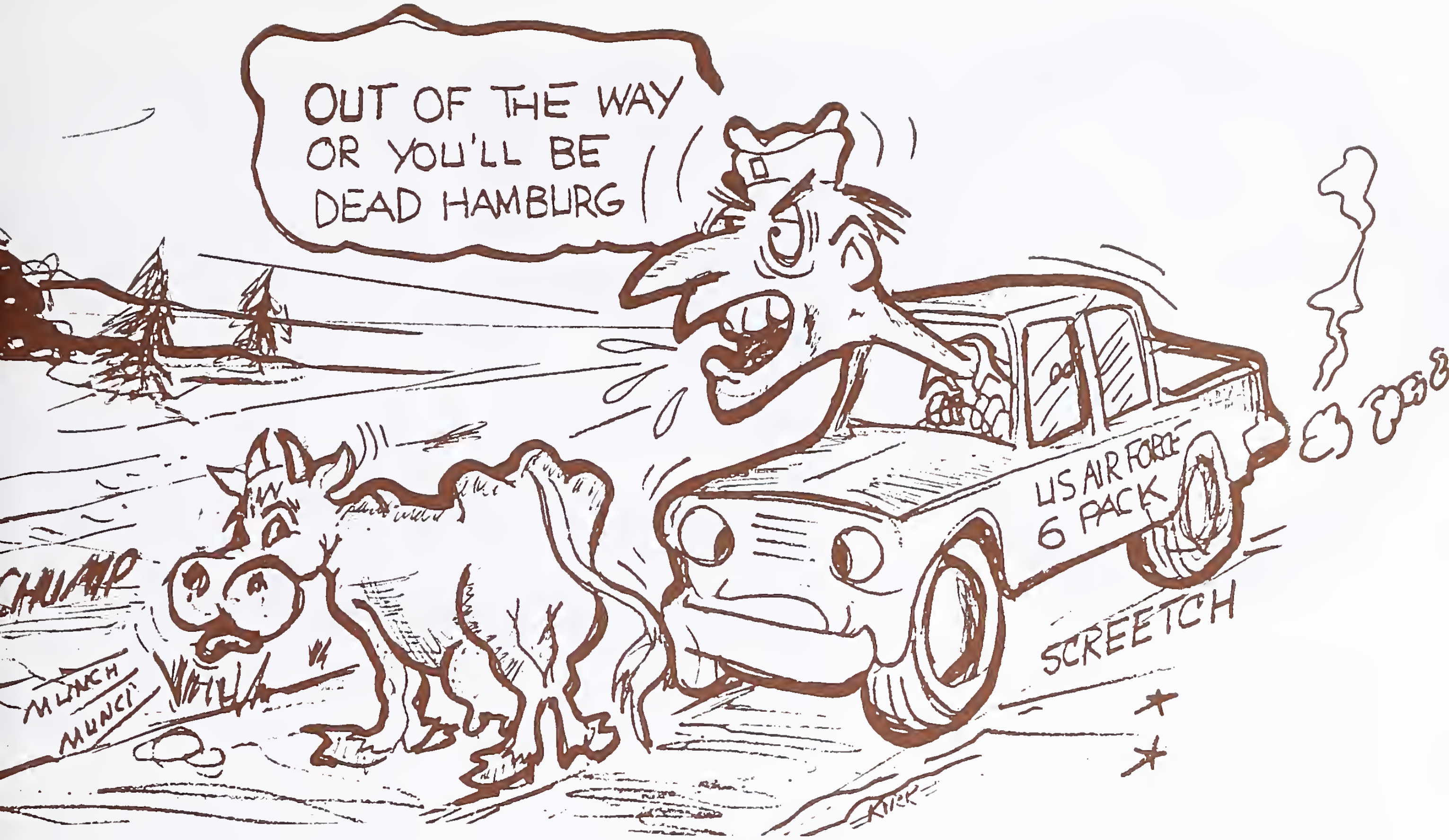
"Perform a careful inspection before you sign the good old Standard Form 1800. Pay extra close attention to things like tire condition, brakes, fuel leaks, and directional lights. And for heaven's sake, make darn sure the UHF radio is working — the only thing worse than breaking down would be breaking down and not being able to tell TCC about it. P.S., don't bother accepting a vehicle with one or more broken seat belts — it'll save you a trip back to the motorpool because I won't ride in it!

"Know what to expect on the route. If you're not sure about just which turns to make, open the trip book. Sure would have helped Mark a couple of months ago."

"What happened?"

"Seems like Mark had a little encounter with some barb wire fence. He and his deputy generally work Bravo-Zero but ended up with a November-Zero alert. Statement said they weren't too familiar with the route and were buzzing down a gravel road on a foggy morning when suddenly a stop sign appeared on the side of the road. Unfortunately, due to excess speed they were unable to stop and slid through the intersection into a field. I suppose the 100 yards of fence they tore down slowed them pretty fast.

"Be prepared for the unexpected. There's a lot of animals around these parts and they don't seem to look before they cross. Last year we had something like six different animal strikes, mostly deer. Once upon a time there were two crew bears headed up towards Juliett-Zero. About halfway out, a herd of sheep decided that the grass did indeed look greener on the other side."



"Oh no," I gasped.

"Yup, you guessed right, one bloody crew vehicle and a bunch of semi-skinned sheep. Probably wasn't any way they could have avoided that accident but to their credit they kept the truck on the road. Next pre-D there were two sheepskins on their chairs and a lot of baa's.

"Defend against other drivers. Traffic control signs don't guarantee that someone will yield the right of way. In fact you may be surprised to find that there are quite a few uncontrolled intersections in these parts.

"Be especially aware of those big farm tractors. Wasn't too many months before you got here that my old dep and I came upon a fresh two-car accident. The woman killed hadn't violated the stop sign — the other guy did, not that the end result was any different. Goes without saying though that some defensive driving on her part might have made the difference. Maybe just blowing the horn if it looked like he wasn't going to stop. Come to think of it perhaps there is a reason why we drive with our headlights on in the daytime. . .

"Defend against the weather. I don't know if it snows where you're from but it sure does up here. Sideways. And does it get icy! Be advised that not only do you need to know about driving in snow country, you frequently get to practice before the plows arrive. Oh yes, beware of ice beneath the snow. In fact this next little tale of terror should illustrate why brakes need to be applied sparingly on icy roads.

"Will was from the South, and this assignment offered his first taste of winter driving. Along about the first storm last year he and Ted were driving out to India-Zero when they learned first-hand why you don't brake in turns, especially icy turns. There's a steel-sided bridge out near Edna that's probably still got blue paint on parts of it. When they were approaching the turn in the road near the bridge, Ted said something about not using the brakes. Will evidently didn't believe Ted, and applied the brakes. Small consolation that the vehicle was still driveable after they smashed in all four fenders. Had a tough time explaining it all to the DO.

"Know your personal limitations. Can't say there's many who'd admit to it, but I know that the old eyelids get real heavy coming back after a busy alert. Be sure to wake up the shotgun rider for help in staying awake if need be. It's also a pretty good idea to stop for a break part way back and a breath of fresh air." About this time we were pulling up to the LCF gate and the good captain passed our trip info to the flight security controller, SSgt Freefield.

"Good man, that Freefield," my commander said as we waited.

"How so?" I wondered aloud.

"He gives the best vehicle safety briefings in SAC. Includes a neat phrase he coined to really sink the point home — 'Drive to arrive alive.' "

"Sounds like a motto to live by," I concluded.

About the author. 2Lt McCormick is a distinguished ROTC graduate of Norwich University. He currently serves as a DMCCC with the 446 SMS, Grand Forks AFB, ND.

25 YEARS OF MINUTEMAN DETERRENCE

341 SMW
1962-1987

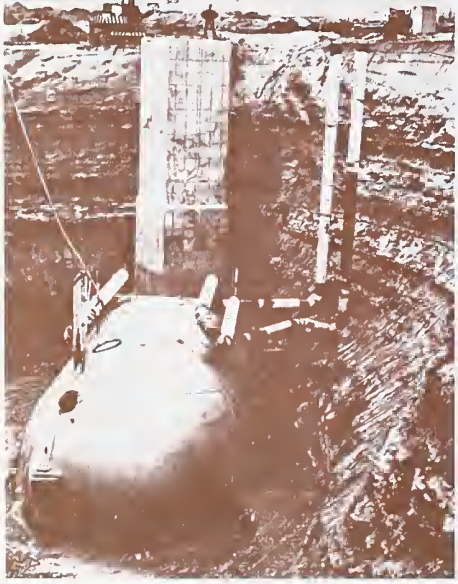
MALMSTROM'S MISSILES OF OCTOBER CELEBRATION

Lt Patrick Trammelle
Deputy Chief, 341 SMW/PA

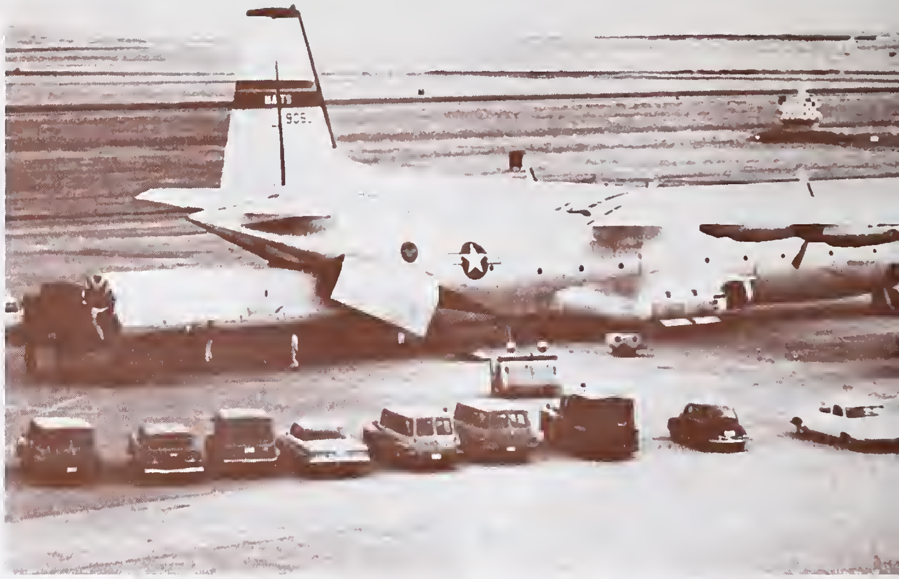
Few people noticed the gray haired man shake hands and embrace. The two were speechless as they moved slowly to their vehicles. Parting waves and thoughtful half smiles later, the men drove off.

Those men were just two of more than 500 people who attended Malmstrom Air Force Base's Missiles of October celebration Oct 23-25.

The Boeing Company built launch control centers for the Minuteman Modernized Weapon System.



Can You Identify This Plane?
Give Us A Call.



The first Minuteman missile in the state of Montana is unloaded.

The celebration, held in the Big Sky Country of Great Falls, Montana, recognized 25 years of missiles on alert. The event looked back to 1962, when the nation's first flight of Minuteman missiles went on alert in the 341st Strategic Missile Wing.

It was during the Cuban Missile Crisis that President Kennedy told the world of Malmstrom Air Force Base, calling it the "nation's ace in the hole." At the height of that conflict, the 10 Strategic Missile Squadron's (SMS) went green, marking the Minuteman's first day of strategic alert.

At that time, Secretary of State Dean Rusk said, "We're eyeball to eyeball and I think the other guy just blinked."

But just what was it like to be in the 10 SMS at that time?

Tom Sloan, a Boeing Aerospace engineer, remembers it well. At age 23 he served as the civilian technical adviser at ALFA-1, the first missile flight to be activated at Malmstrom.

"I remember the Cuban Missile Crisis like it was yesterday," he said. "I worked for Boeing, and I worked hard.

"On Oct 15, 1962, Mel Paisley became my direct supervisor. He picked me up at Great Falls International Airport and took me straight to the ALFA-1 site. I worked for eight straight days in that capsule. It was like being in a submarine," said Sloan.

"I don't remember sleeping. I just gave directions and played a troubleshooter role. Looking back, it was a high stress job," said Sloan.

"There was a sense of urgency," he said, "but nobody cracked under the pressure. The Air Force people and the engineers gave a total team effort. We're talking total dedication—total professionalism.

"On the 23d, we sent a message to the Pentagon. The boards were green . . .all 10 missiles were ready to go. It wasn't easy, but the Russians knew we were ready to launch," said Sloan.

Mel Paisley was Boeing's engineering manager at Malmstrom. He later served as the assistant secretary of the Navy for research, engineering and systems.

"Getting that first flight up was hectic. We had a lot of assembly and checkout testing to do on the missile systems, and little time to do it. Getting those babies on line was a tough job," said Paisley, who slept on storage shelves when he got away for short naps.

"We were all tired, but we were successful for one reason—we were all one big team," said Paisley. "I spent 28 years at Boeing and never saw more team spirit than at that time. Our nation was in danger. We were serious. There were no doubts. . .we weren't playing. It was for real."

Those on the Air Force side of the house agree.

"Visualize a program in peacetime. Readiness is the key. But throw in an international crisis, and you've got real life pressure. The Cuban Missile Crisis threatened America's freedom and very existence," said retired Air Force General Samuel Phillips, who was the Minuteman program director from mid 1959 to 1963.

"I can honestly say I wasn't nervous. Our crews then, as they are today, were highly professional. They held their own, and Boeing pressed to help prepare the Launch Control Centers," said Phillips.

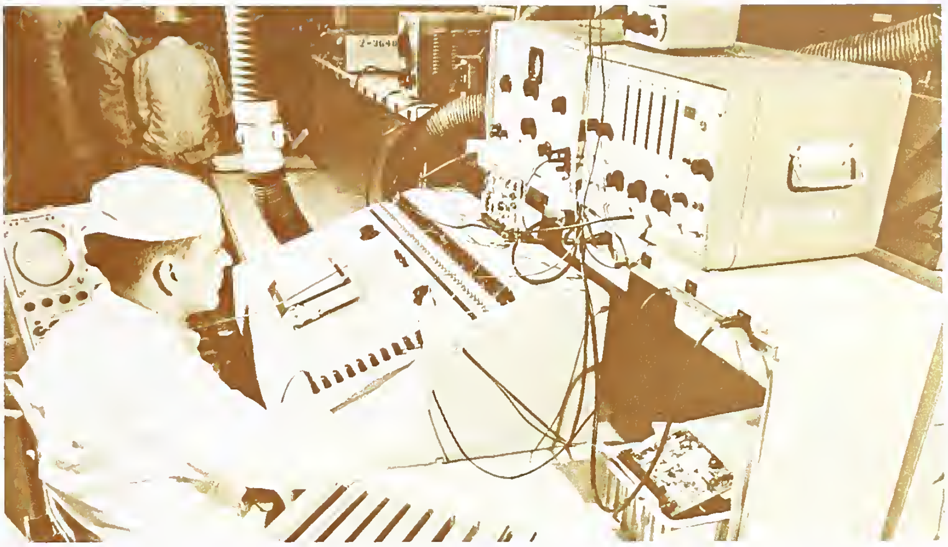
"All along I felt we were ahead of our time. We're fortunate here in the United States. We've always been frontrunners in technology, and the Cuban situation was no different," he said.

Retired Air Force Lt Gen Harry Goldsworthy played a key role in preparing President Kennedy's "ace in the hole." He served as the Ballistic System Division's Site Activation Task Force commander.

"I oversaw silo construction, getting the Minuteman missiles in place, and handing the system over to the Strategic Air Command," said Goldsworthy. "The people of Great Falls, Montana, are really special," he added. "They knew we were at a critical point with the Soviets, and they knew there was danger. But they supported us while we were working to bring the sites on line.

"We poured tons of concrete and ran more than 1800 miles of pressurized underground cable. It was strange—we couldn't be criticized because we were doing something that had never been done before. And we did a wonderful job," said Goldsworthy.

Ron Rice is a Great Falls resident who vividly remembers the conflict of 1962.



An electronic technician tests circuit cards assembled at the Boeing Aerospace Division in the early 1960's.

"Television was new here in those days," said Rice reflectively. "But you can bet your boots that everybody in town saw or heard John Kennedy's "ace in the hole" speech. We knew there was serious tension, but we also knew our missiles were needed to deter the Soviets.

"Great Falls is a proud town. We're damn proud of our Air Force people and I'm proud to be an American," said Rice. "It's amazing that our missiles have been on alert for 25 years now."

And 25 years it's been.

The observance reunited retired and active duty Air Force people, civilians, contractors and history buffs. Large groups of Malmstrom alumni flew in from Offutt, F E Warren, Vandenberg, March and Andrews Air Force Bases. In fact, people came from all over the United States to celebrate 25 years of peace through deterrence.

A salmon barbecue at Malmstrom's Officers Club, followed by a 1960's fashion show and sock hop, began the festivities. The 724th AF Band from McChord AFB, Wash., had everyone from missileers to past maintenance troops tearing up the dance floor.

On Oct 24, attendees participated in symposia, including topics such as the history and future of Minuteman, the Soviet arms buildup, and the effect on the Air Force of the new Peacekeeper and Small ICBM programs. The day was filled with reunions, tours and contractor's displays.

The celebration peaked that night with a banquet at the Sheraton Great Falls. Various Air Force leaders shared their memories and experiences of the Minuteman system from its beginnings in 1962 to the present.

Malmstrom's wing commander, Col Richard Keen, praised the reliability of Minuteman. "The Minuteman system is one of the most effective deterrents in this nation's arsenal. It has an outstanding safety record, it's easily maintained, and it has helped keep this nation at peace for the past 25 years.

"The key to the program's success, however, is the people who've sacrificed over the years," the colonel said. "The 341st has a proud history. The people who've joined us at this celebration know that, and have given their all to better President Kennedy's 'ace in the hole.' "

Motivated people, combined with Strategic Air Command's passion for excellence, have given the United States many years of peace and freedom. As old and new friends gathered at Malmstrom's Missiles of October celebration, many were reminded of the importance of SAC's mission.

And while two old pals drove off with special memories and renewed friendship, two new crew pals—as well as many others—were on alert. Protecting our God-given freedoms is a job that will never end.

ELECTRICAL FIRE ISOLATION (CP reads)

There I was...

Capt Robert M. Dugan
4017 CCTS, Castle AFB

"AC, nav...do you smell anything electrical?"

"Yeah I do...why don't you see if you can find the source, GCI will keep us in the area."

"Rog...Nav's off interphone."

I checked our position on radar and crosschecked it with the ancient ASN-7 nav computer. We were right about over the ARCP for Sandy Anchor over central Germany. Our last set of receivers was still delayed on the ground but would be up soon for their night air refueling. Our boom operator was in the pod and our crew chief was in the cargo compartment.

I started my search by checking out the components in the electronic cabinet. Nothing was wrong there, and the odor seemed stronger over by the main circuit breaker panel and the boom seat. I suspected that it might be the aircraft battery located in the latrine. But the battery was cool and nothing seemed to be leaking out of its casing. Next I checked the main circuit breaker panel and sniffed around the voltage regulators next to the boom's seat. No breakers were popped and none of the units were warm to the touch, but the odor was stronger in this area.

Checking further I found that the smell was coming from the "hell hole" below the cockpit floor. Before opening the grille and heading underneath I grabbed my flashlight and went into the cargo compartment to get the crew chief so he could help me narrow down the source of our problem and perhaps perform some of the maintenance magic that so many crew chiefs are capable of. After I explained the situation, the chief and I headed for the lower nose compartment.

Here is where I made two mistakes. First, we were about to enter the lower nose compartment without an oxygen source. Although we were not above FL 250, a suspected electrical fire in the lower nose compartment would have made it prudent to provide ourselves with oxygen. Second, I had not kept the aircraft commander informed of the progress of my search. Although my interphone cord would not reach into the "hell hole," I could have taken the time to tell the AC that we had isolated the area of the odor. Armed with this information he could have elected to enter the Dash One to initiate the "Electrical Fire Isolation" checklist to find the problem.

As it was, the crew chief and I climbed down into the compartment. As the crew chief clamored over the nose wheel well housing to check out the forward part of the compartment, I crouched down next to the Transformer-Rectifier (T-R) rack. Putting my hand on the rack for support I was shocked by the heat generated by the number two T-R unit. I touched it again and pulled my hand away quickly—it was like touching a hot iron. (Mistake number three...I was not wearing my flight gloves.) I yelled for the crew chief to get back from the forward compartment. As he started crawling back I reached up through the crew entry chute and grabbed the fire extinguisher attached to the fuselage. Just as the chief scrambled over the nose wheel well the number two T-R began to spark and spew a large volume of smoke which quickly seeped up through the floor and filled the cockpit. I pulled the pin on the extinguisher and began to spray the small flames licking around the T-R. After a few quick bursts I realized I had to let the AC know what was happening. Since the crew chief had crawled out to a position next to the T-R rack and I was crouched down on the crew entry door, I handed him the extinguisher to continue fighting the fire while I jumped up to the nav table to get back on interphone. By this time the adrenalin was really flowing as I fumbled with the comm cord plug and the interphone jack.

"We've got a fire in the 'hell hole'."

"Get on oxygen nav! Where's the boom?"

The aircraft commander and the pilot were both on helmet and the boom had just entered the cockpit. He had checked off interphone and come forward to see if he could help in the search when all hell broke loose. As I worked to get on oxygen the crew chief was yelling for someone to pull the T-R circuit breakers. Our boom knew right where they were on the main circuit breaker panel. As soon as the breakers were pulled, the T-R ceased to pour out smoke and flames. The crew chief climbed out of the entry chute and grabbed the boom's oxygen mask—the bromochloromethane from the fire extinguisher and the acrid smoke from the fire had gotten to him. Meanwhile the boom reached up and opened the sextant port to begin clearing out the smoke that still lingered in the cockpit. I informed the AC that the fire was out and that everything seemed to be under control for the moment.

"Nav, find me the nearest emergency base in case we need to get down quick."

I had to get back into the seat and find where we were and determine our best emergency airfield. But when I looked into the radar scope it was blank. Also, my

FUSELAGE/ELECTRICAL FIRE (CP reads)

When fire is discovered in any part of the airplane by any crewmember, notify the pilot, go on 100% oxygen, and proceed with fire control procedures. Pilot or copilot will inform crew "Fuselage Fire" on CALL position of interphone.

1. Oxygen - 100% (ALL)

   All personnel shall don oxygen masks and breathe 100% oxygen. Portable oxygen bottles may have to be used by the crewmembers engaged in fire fighting procedures. One crewmember designated to combat the fire will don the firefighter's mask, connect the mask to a source of 100% oxygen, and don the firefighter's gloves.

2. Fire - Combat (N, BO)

   Boom operator and/or navigator shall institute fire fighting procedures. For electrical fire, see ELECTRICAL FIRE ISOLATION procedures, this section. One crewmember shall keep the pilot informed of the fire condition until it is extinguished or determined to be uncontrollable. Prudent judgement must be used by the pilot in the determination of the actions to be taken. If passengers are aboard and oxygen duration is a problem, consideration should be given to initiating an Emergency Descent. The severity of the fire may be lessened by oxygen deprivation through airplane depressurization. If smoke and fumes are excessive, see VENTILATION portion of SMOKE AND FUME ELIMINATION (BLEED AIR SYSTEM), this section. If the fire becomes uncontrollable, the pilot should land immediately or bail out as applicable.

panel lights were out. Glancing at the overhead panel I saw that the number two generator and its bus tie were tripped off. We had lost the number two generator and all of its associated equipment. The AC was already working the problem so I concentrated on finding our position. As far as I was able to calculate, the whole incident had taken no more than ten minutes based on the fix I had taken before getting out of the seat.

"AC, Hahn is right below us if we need to get down."

"Roger, take Comm 2 and let GCI know what's going on."

I informed the radar controller of our situation and told him we may be declaring an emergency and requesting landing clearance at Hahn.

Things started to calm down quickly. The smoke had just about cleared out and now our only problem was the loss of the generator. The pilots began to work their checklists to determine what equipment had been lost. Luckily we still had our radios and tacan operating. Without our search radar we would now be depending on tacan and vectors to get back to Fairford. We coordinated our clearance back home and told the GCI that everything was under control. Our return flight and landing at Fairford were uneventful, but it had been a very exciting mission nonetheless.

In hindsight a few lessons can be learned from this incident.

If an electrical fire is suspected, get into the Dash One and try to isolate the source per the checklist.

Be familiar with the location of all major electrical components and their circuit breaker location. If we had pulled the circuit breaker immediately we may never have had a fire. Luckily our boom knew where to look when the T-R started to burn.

When searching for the source of a fire/odor, wear your flight gloves, take oxygen and keep the aircraft commander as well informed as possible.

Know where your fire fighting equipment is located and how to use it. You won't have time to read the instructions as the aircraft burns around you.

As a crew, talk over what would need to be done in the case of an inflight fire. Who's going to talk on the radios, who's going to fight the fire, how will you communicate with each other? A good plan talked over often enough will become automatic if it's ever needed.

For navs, never be complacent about your position awareness. All of Europe is one big airfield, but if you're over central Nevada and need to land in a hurry due to an inflight fire, do you know which civilian fields have enough runway to land a tanker? Your SAC/Air Force emergency airfields every 300 miles may not be enough. Check it out on mission planning day; have a plan in mind for each segment of your route of flight. Also, are you ready to handle aircraft navigation without certain nav systems operating? (Beware all you INS'gators!)

Luckily our inflight fire incident was relatively minor and easy to handle. We did a lot of the things right and the mistakes we did make didn't come back to bite us. Just remember; it can happen to you. Are you prepared?

PROFESSIONAL PERFORMERS

Well Done!

Sgt Marcella A. Waters was riding with the Supervisor of Flying (SOF) as an on-the-scene flying scheduler during the launches of B-1B aircraft for GLOBAL SHIELD 87. While parked on the hammerhead, Sgt Waters noticed fluid leaking from the left engine pod which had escaped the SOF's attention and immediately informed him. Maintenance discovered an accessory drive gearbox (ADG) leaking. Had the aircraft taken off with this problem, a heavyweight three-engine or a serious engine fire could have resulted. Engine fires are serious in the B-1B due to the close proximity of fuel. Her alertness and aggressive reporting saved substantial maintenance costs and possibly lives. **Well Done!**

Flying Crew

On 1 April, 1987, crew E-103 of the 384 AREFW, McConnell AFB, reported to tanker operations at Keflavik NAS, Iceland. For the crew of Maj Larry Greathouse, AC; 1Lt Brian Stopher, P; 1Lt Matthew Tucker, N; and SrA Gregory Gibbs, BO; that day was outprocessing day and the crew was officially off alert status. At 1130 the Det 1 commander asked Maj Greathouse and his crew to go to the alert aircraft and start preparing it for a quick launch by the primary alert crew. The weather had rapidly changed and was threatening the safe recovery of six F-15s who had launched earlier. The weather continued to rapidly deteriorate and by 1200 hours was below safe recovery minimums for the F-15s, who were also below divert fuel. Unless something could be done quickly, the F-15s would have to attempt an emergency recovery into Keflavik in weather conditions well below safe requirements or abandon their aircraft when fuel ran out. Aircrew death from exposure was almost certain if ejection was required. The local weather conditions were now vicious—winds 25 to 35 knots with a tough crosswind, visibility about 3/16 of a mile in blowing snow, and ceiling 150 feet obscured. However, when directed to launch by the Icelandic Tanker Detachment Commander, who also was now on the aircraft to help, the crew made a perfect takeoff. In very short time, despite the heavy IFR weather, they rendezvoused with the fighters, who now had less than one hour of flying fuel left. Quickly taking command of the flight, Crew E-103 directed the refueling to ensure all fighters had safe fuel loads and then, while continuing to refuel the fighters, escorted them to a safe recovery at their alternate of RAF Lossiemouth, Scotland, over an hour southeast of Keflavik. The mission was concluded by a perfect approach and landing for the tanker at RAF Mildenhall, United Kingdom. The skill and airmanship displayed by these professionals showed exactly what SAC can do when the chips are down. **Well done!**

Aircraft Maintenance

SSgt Gregg C. Liljestrom, 384 BMW, McConnell AFB, is SAC's Aircraft Maintenance Airman of the Month.

As the assistant NCOIC, Nondestructive Inspection (NDI) Laboratory, Sgt Liljestrom plays an integral part in processing a monthly average of 900 oil sample tests, four ruddervator radiographic inspections and 300 parts. When the Kansas Air National Guard began its conversion from the F-4 to the F-16, Sgt Liljestrom helped them identify the needed equipment and also guided them in the development of their procedures. Selected by his squadron to head the B-1B conversion section, he served as liaison to the building contractor and helped orchestrate the renovation of three FMS buildings at a cost of three million dollars. Sgt Liljestrom has proven to be an invaluable asset in his wing's preparations for the arrival of the B-1B.

Missile Maintenance

SSgt Roderick R. Tank, Facilities Maintenance Teams Shop (FMT), 394th Intercontinental Ballistic Missile Test Maintenance Squadron, Vandenberg AFB, is SAC's ICBM Maintenance Airman of the Month. As team chief, he spearheaded diesel installations at two launch facilities (LF's) in support of the Peacekeeper program. Assisting HQ AFLC technicians, Sgt Tank identified and corrected numerous problems in a newly installed brine chiller at a launch control facility (LCF). His attention to detail resulted in the site being returned to operational status in minimum time. Working hand-in-glove with HQ SAC engineers, he installed and checked six Minuteman power processors. His knowledge of electrical circuitry and wiring diagrams minimized downtime and ensured the proper operation.

Munitions Maintenance

SSgt Lola F. Vicary, 96 BMW, Dyess AFB, is SAC's Munitions Airman of the Month.

Her performance as a weapons release team chief/technician is a direct reflection of her professional management and dynamic leadership abilities. As a weapons release team chief during the B-52H/AGM-69A phase down, Sgt Vicary was personally responsible for the checkout of five B-52H's with eight SRAM missiles per aircraft. Not one discrepancy was noted, and the aircraft and missiles were shipped ahead of schedule. During the B-1B phase in period, Sgt Vicary continually volunteered to work many hours of overtime to verify and validate new pylon launcher missile simulator (PLMS) procedures. Due to her unyielding desire for perfection, the PLMS was validated in minimal time.

cont'd from page 15

assume Cat III conditions in all abort cases, it does establish a strong argument to regard S-1 as the safest, most conservative abort speed. Sometimes, however, the situation doesn't always allow for the most conservative approach. Instead it requires expert judgment and a **total** understanding of the aircraft's capabilities, based on gross weight, winds, thrust available, temp, etc.

The data shows that the takeoff is under Cat I conditions, with S-1 (CEFS) being less than refusal speed (VREF). Since the emergency occurred at a speed greater than S-1, but less than VREF, the aircraft is probably capable of being stopped prior to the end of the runway. Stopping safely on the runway is dependent on the aircraft commander initiating the abort procedures immediately. Remember, VREF is four engine acceleration; losing an engine after S-1 and based on accelerating on only three engines to VREF may take more runway than originally planned.

In this case, we aborted at less than VREF which by definition means that we should be able to stop **short** of the end of the runway. The loss of the outboard spoilers will degrade the effectiveness of the abort. Considering the recent change in the abort boldface, on a dry runway, main gear braking (versus speedbrake induced loss of lift) is the most critical factor in safely stopping the aircraft. Therefore, it is conceivable to stop the aircraft in the remaining runway without exceeding the maximum brake speed or attaining hot brake speed. However, unless the aircraft is light, an abort after S-1 will almost always cause hot brakes!

In our scenario we've seen how several combined conditions alter the rationale we use in applying the Dash One to a unique situation. Remember that the Dash One "...provides the best possible operating instructions under most circumstances, but is a **poor substitute for sound judgment**"! It is designed to provide understandable guidance to the "...**least experienced crew** expected to operate the aircraft." Apply your conditions to the boldface procedures and decide how you will tailor your actions to fit the specific case for which you are confronted with. Brief accordingly. There's nothing wrong with keeping quiet after S-1 as long as your actions have been planned and reviewed ahead of time.

In this abort situation, you may wish to consider that should rotation speed be less than VREF, abort for unusual conditions might still safely occur after S-1. Each situation is unique, so brief accordingly. Talk this over with training flight and the experts in Stan/Eval. Practice different situations in the cockpit procedures trainer and see if you can tailor your response to new conditions. While CPT may not give accurate indications about stopping in the confines of the runway, it is a useful laboratory to test your responses.

Having considered the situation before it actually occurs and having a safe solution already thought out and ready to implement means that **you** will control the situation, and not simply be a passenger or a disaster waiting to happen. Use this "safety paradigm" to prepare for the unexpected and make each flight a safer one.

SAC SAFETY SCREEN

The SAC Safety Screen is an honor roll of SAC's most professional crews. To gain listing on the Screen, crew members must be nominated by their unit commanders and meet high selection criteria of experience in their aircraft or missile system *IAW AFR 127-2/SS1.*

7 AREFS, Carswell Crew R-132: AC Capt Steven W Helveston, P 1Lt Dennis D Jones, IN Capt Steven K Break, IBO TSgt Michael R Matlock

9 BMS, Carswell Crew S-32: AC Capt Brian C Rogers, P 1Lt James D Gensheimer, IRN Maj Thomas F Smith, G SrA Timothy K Brinsm

20 BMS, Carswell Crew E-24: AC Maj Barry R Shipley, P 1Lt Brian E Hill, RN Capt Jeffery L Smith, IN 1Lt Hoby D Fleece, EW Capt Michael A Seavey, AG A1C Juan A Acosta

62 BMS, Barksdale Crew E-35: AC Capt Leonard P Jankowski, P 1Lt Keith A Kimmerle, RN Capt Robert W Bratcher, N 1Lt Charles M Hooks Jr, EW Capt Kurt W Rhor, G A1C Douglas L James

71 AREFS, Barksdale Crew R-124: MP Capt Kathaleen A Wildhaber, MC Capt M Eric Goetz, MC 1Lt Eric R Johnson, MN 1Lt James F Reed, IB TSgt Vivian D Hunt

91 AREFS, McConnell Crew R-108: AC Capt Warren R Cole, P Capt Christopher C Nichols, IN Capt Charles R Mayberry, BO A1C Thomas C Day

384 AREFS, McConnell Crew E-155: AC Lt Col Dennis W Fowler, P 1Lt James A Altieri, IN Capt Keith W Moncrief, IBO SSgt Ray N Templeton

91 SMW, Minot Crew R-132/116: MCCC 1Lt Leonard Flaum, DMCCC 1Lt William F Sims

44 SMW, Ellsworth Crew E-099/E-152: MCCC Maj Robert W Grace, DMCCC 2Lt Christopher W Sweet

91 SMW, Minot Crew E-035: MCCC 1Lt John F Chattin Jr, DMCCC 2Lt John D Garey

351 SMW, Whiteman Crew R-131: MCCC 1Lt James A Saul, DMCCC 2Lt Harold J Sharp

134 AREFG, McGhee Tyson Airport (TENANG): AC Lt Col Glen A Knable, P 2Lt Lewis H Harding, N Lt Col Frederick J Mynatt Jr, BO MSgt Clinton L Haley

43 AREFS, Fairchild Crew R-130: AC Capt Mark A Gregg, P 1Lt Jeffrey M Delamater, N Maj Gregory A Binder, N 2Lt Marshall K Kendrick, BO SSgt Karl D Smith

43 AREFS, Fairchild Crew R-131: AC Capt Steve Z Pasinsky, P 2Lt David W Williams, N Capt Timothy S Duerson, BO A1C Michael J Overton

24 SRS, Eielson Crew S-02: AC Capt Lawrence Appel, P Capt David Lawlor, N Capt Gregory Small, N Capt Charles Grimes

24 SRS, Eielson Crew S-12: TC 1Lt Dale Smith, R1 1Lt Anthony Hutfles, R2 1Lt Jeffrey Koonz, R3 1Lt Lewis Graeff, R4 1Lt Blaise Burgman, ET TSgt Timothy Catlett, PT TSgt Richard Oehrig

60 BMS, Andersen Crew R-12: AC Capt Jack S Caszatt, P 1Lt Timothy L Nesemier, RN Capt Richard L Melass, N 1Lt Gregory C Ray, EW 1Lt Roger T Gauert, AG Sgt James R Hungate

60 BMS, Andersen Crew R-32: AC Capt Probyn Thompson III, P Capt Gregory J Gordon, RN Capt Dudley L S Woods, N 1Lt Robert M Ennis, EW 1Lt Paul R Shearer, AG A1C William M Johnson

349 AREFS, Beale Crew R-143: AC Capt Edward H Jarrett, P Capt John Smarsh Jr, N Capt William M Bowers, BO SSgt Gary A Plain

350 AREFS, Beale Crew R-192: AC Capt A C Collins, P 1Lt Jim Thompson, N 1Lt Jeff Bigelow, BO SSgt James O'Brien

350 AREFS, Beale Crew R-163: AC Capt Robert E Neighbour, P 1Lt Jeffrey Loken, N Capt Bryan Dooley, BO A1C Rodney Cline

92 AREFS, Fairchild Crew R-165: AC Capt Paul Y Lepoullouin, P 1Lt Thomas C Echols, IN Capt Michael J Landry, BO SSgt Michael C Barnes

92 AREFS, Fairchild Crew R-174: AC Capt David W King, P 1Lt Brian B Hansen, P 2Lt John T Burt, IN Capt Matthew F Laiho, IBO SSgt Robert L Beth

325 BMS, Fairchild Crew E-31: AC Capt Donald Davitz, P Capt Gary Kinzie, P 2Lt David Sumrell, RN Capt Michael Norcini, N 1Lt Christopher Lloyd, EW 1Lt William Bailey, G SSgt Eric Choker

325 BMS, Fairchild Crew R-62: AC Maj Dan Carter, P 2Lt Nolan Elliot, P Capt Anthony Siler, RN Capt Gilbert Jow, N 1Lt Richard Miller, EW Capt Philip Hacker, G TSgt Paul Kononchuk

99 AREFS, Robins Crew R-163: AC Capt Mario Mastrandrea Jr, P 1Lt William Wooten, N 1Lt H Wayne Holwick, BO A1C Jeff Whited

912 AREFS, Robins Crew E-111: AC Capt Leo C Lundy, P 2Lt James C D'Amour, N 2Lt Gregg A Dibert, BO SSgt D Dwayne Wiley

42 AREFS, Loring Crew R-123: AC Capt William Wilson Jr, P 1Lt Douglas Cassela, N Capt John Kukowski Jr, BO A1C Tyler VanErt

42 AREFS, Loring Crew R-135: AC Capt Darren McDew, P 1Lt Patrick Poeschl, N 2Lt Jeffery Gettle, BO A1C John Pichette

407 AREFS, Loring Crew R-165: AC Capt Patrick Lane, P 1Lt Richard Burton, N Capt William Peters, BO TSgt Robert Cludinski

524 BMS, Wurtsmith Crew E-36: AC Capt Randall R Tanksley, P 1Lt Timothy Tremper, RN Maj William K Thacker, N 1Lt Mark D Vernick, EW 1Lt Michael E Radcleffe, AG A1C Rick Hosler

920 AREFS, Wurtsmith Crew R-154: AC Capt Kenneth A Hendrickson, P 1Lt Roxanne G Hernandez, N 1Lt Ralph W Lunt, BO Amn Robert L Parhah

528 BMS, Plattsburgh Crew E-11: AC Capt David A Hutchinson, RN Capt Kim A High

528 BMS, Plattsburgh Crew E-12: AC Capt Daniel S Gruber, RN Capt William E Law Jr

529 BMS, Plattsburgh Crew R-81: P Capt Wallace B Zane, N Maj Bradley K Higginbotham

529 BMS, Plattsburgh Crew E-61: P Capt Theodore K Pounds, N Capt Dirk J Saltzgaber

46 AREFS, K I Sawyer Crew R-112: AC Capt William A Nichols, P 1Lt Robert J Sanderson, N 1Lt Dale T Fadley, BO Amn Kyle G French

46 AREFS, K I Sawyer Crew R-133: AC Capt Daniel M Harrier, P 1Lt Craig A Creed, N 1Lt Michael J McInerney, BO SSgt Richard D Kempfer

307 AREFS, K I Sawyer Crew R-184: AC Capt Peter C Cantwell, P 2Lt Kenneth A Brackney, N 2Lt Rachel R Nixon, BO A1C John L Tongusi Jr

644 BMS, K I Sawyer Crew R-15: AC Capt Kevin M Keith, P 1Lt William C Hook, RN Capt Jimmy D Lane, N 1Lt John L Spellmeyer, EW 1Lt Daniel R Rocha, G SSgt John M Ricks

644 BMS, K I Sawyer Crew R-32: AC Capt Steven R Andrews, P 1Lt Brian K Bartels, RN Capt Michael T Saxton, N 1Lt Keith G Whyte, EW 1Lt Donald F Mattner Jr, G Amn Thomas J Williams

668 BMS, K I Sawyer Crew E-36: AC Maj David A Shunk, P 1Lt Leslie L Odgers, RN Capt Bryan M Branby, N 1Lt Howard P Duffy, EW 1Lt Faustino A Perez G SSgt Ricky L Hollins

41 AREFS, Griffiss Crew R-109: AC Capt Charles W Picardy, P 1Lt Lionel H Wynn, N Capt Bradley G Lockhart, BO A1C Timothy R Smith

306 AREFS, Altus Crew R-171: AC Capt Del Williamson, P 1Lt Dave Taylor, N 1Lt Tom Carlin, BO A1C Tony Sousa

509 AREFS, Pease Crew E-111: AC Capt Michael J Boldosser, P 1Lt Karen K Krukonis, N Capt John R Ingham, BO A1C Mark D Reuter

509 AREFS, Pease Crew R-112: AC Capt Paul N Blodgett, P 1Lt James M Tries, N Capt William O Simpson, BO A1C Beth A Tyc

715 BMS, Pease Crew E-26: P Capt Joseph D Cardwell, RN Capt James M Kenny

715 BMS, Pease Crew E-36: P Capt Lawrence E McCabe III, RN Capt Curt L Wheeler

393 BMS, Pease Crew E-17: IP Capt Richard L Casey, IN Capt Randy J Nunley

393 BMS, Pease Crew R-29: P Capt Andre R Guillemot, RN Capt John J Slavoski

393 BMS, Pease Crew R-31: P Capt Thomas C Blake, RN Capt Scott M Dowty

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FLARE

THERE ARE NO HEROES IN THIS LOCKER ROOM.

Please Don't Drink and Drive.

A message from the Reader's Digest Foundation